Implementation Of Virtual Reality (VR) in Enhancing Students' Speaking Skills

Abdur Rosyid[1]*, Fahri[2], Fauris Zuhri[3], Fithriyah Inda Nur Abida[4], I Putu Permana Mahardika[5]

[1,2,3,4]Universitas Negeri Surabaya
[5]Universitas Gajah Mada

*email Correspondence: abdurrosyid@unesa.ac.id

Abstracts
This research seeks to explore the role of Virtual Reality (VR) technology in aiding students to build their speaking skills, as well as to evaluate the effectiveness of VR in enhancing these abilities. The study uses a classroom action research approach with a cyclical model across two cycles, each comprising the stages of planning, implementing actions, observing, and reflecting. Data was collected through performance tests and observations, and analyzed using both quantitative and qualitative descriptive statistics. The results reveal that VR implementation significantly improves students' speaking skills. This improvement is demonstrated by the rise in students' average scores across cycles; the first cycle showed an average score of 66.15 with a classical completeness rate of 60%, while the second cycle increased to an average score of 77.3 with a completeness rate of 80%. These findings suggest that VR is an effective tool for enhancing students' speaking proficiency, offering an immersive and interactive learning experience that fosters greater confidence and engagement in language practice.

Keywords: Educational Technology, Virtual Reality, Speaking Skills Development

1. Introduction

In today's globalized world, effective communication skills, particularly speaking abilities, are essential for students to succeed academically and professionally (Byram, 2009), (Mahajan, 2015), (Pfeifer & Head, 2018). Proficient speaking abilities are crucial for students not only to excel in their academic pursuits but also to thrive in their future careers. The ability to articulate thoughts clearly and confidently is essential in a variety of situations be it in classroom discussions, professional presentations, job interviews, or casual conversations (Khamkhien, 2010), (Rao, 2018), (Zakirova et.al, 2020). As interactions become more diverse and complex, the demand for strong verbal communication skills continues to rise. Despite the recognition of the importance of speaking skills, many students struggle to develop these abilities due to various barriers. One significant factor is anxiety (Indrianty, 2018), (Ikhsaniyah, 2022). Many learners experience fear or discomfort when speaking in front of others, which can hinder their performance and discourage them from participating in speaking activities. This anxiety can stem from a lack of confidence in their language proficiency, fear of making mistakes, or concerns about how they are perceived by peers and instructors. As a result, students may avoid speaking opportunities altogether, leading

to a cycle of underdevelopment in this crucial area. Additionally, a lack of practice opportunities exacerbates the challenge of developing speaking skills (Nunan, 1989), (Thornbury, 2005).

Traditional language teaching methods have often relied on passive learning approaches, where students are primarily receivers of information rather than active participants in the learning process. This conventional style of teaching typically involves lectures, rote memorization, and repetitive exercises that emphasize grammatical rules and vocabulary without necessarily connecting them to real-world communication (Richards & Rodgers, 2001). In fact, Traditional classroom settings often emphasize written assignments and reading comprehension over oral communication. While these skills are important, they do not provide students with sufficient practice in speaking. Furthermore, large class sizes can limit the amount of individual speaking time each student receives, reducing their exposure to real-world conversational contexts. Without ample opportunities to engage in meaningful dialogue, students may struggle to gain the fluency and confidence necessary for effective communication (Nation & Newton, 2009). Limited exposure to authentic conversational situations can hinder students' ability to adapt their speaking skills to various contexts. Real-life conversations often involve nuances such as tone, body language, and cultural references that are difficult to replicate in a typical classroom environment. When students lack exposure to diverse speaking scenarios, they may find it challenging to navigate different social and professional interactions in the future. These challenges highlight the urgent need for innovative teaching methods that actively engage students in the learning process and provide them with meaningful speaking experiences.

While traditional language teaching methods have mainly emphasized passive learning approaches, this study presents an innovative and immersive learning experience that actively engages students in realistic conversational scenarios. Virtual Reality (VR) technology has emerged as a viable solution to tackle these challenges. By creating immersive and interactive environments, VR enables students to participate in simulated conversations that reflect real-life situations (Bonner & Reinders, 2018), (Arini, 2023). This technology offers a safe space for students to practice their speaking skills without the fear of judgment, helping to alleviate anxiety and encourage participation (Anderson, 2005). With VR, learners can encounter various contexts, such as ordering food at a restaurant or delivering a prese ntation, allowing them to enhance their speaking abilities in an authentic setting (Annetta et.al, 2009), (Kuna et.al, 2023). Furthermore, the integration of VR in language education aligns with experiential learning principles, which focus on learning through experience and reflection. By actively engaging in VR simulations, students can practice their speaking skills in a manner that feels genuine and relevant (Bainbridge, 2007), (Bombari et.al, 2015). This hands-on approach not only improves their language proficiency but also cultivates critical thinking and problem-solving skills, which are vital for effective communication in diverse situations (Buttusi et.al, 2018).

The application of VR in language education represents a transformative approach to enhancing students' speaking skills. Unlike traditional classroom practices that often rely on rote memorization and passive learning, VR immerses students in simulated environments that closely mirror real-life interactions. This shift allows learners to engage with the language in contexts they will encounter outside the
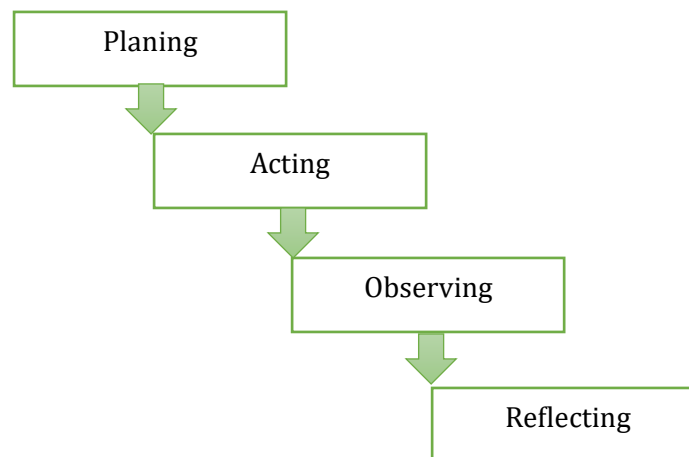
classroom, such as ordering food in a restaurant or participating in business meetings (Chang & Suh, 2023). By practicing speaking in these realistic scenarios, students can develop not only their language proficiency but also the confidence needed to communicate effectively in various situations. Employing a classroom action research approach is essential for the success of this study. This methodology emphasizes cyclical processes of planning, implementing actions, observing outcomes, and reflecting on the experiences. This iterative model enables educators to adapt their teaching strategies continuously based on student feedback and performance. This responsive teaching approach is crucial in meeting the diverse needs of students, ensuring that each learner benefits from the technology in a way that suits their individual learning pace and style. VR technology provides the necessary contextualization for language practice, which is often lacking in conventional teaching methods. When students engage in VR simulations, they are not just memorizing vocabulary or grammar rules; they are using the language in practical, meaningful ways (Daniels, 2021). This contextual learning helps students understand the nuances of communication, including tone, body language, and social cues that are critical in real-life interactions. By bridging the gap between theoretical knowledge and practical application, VR enhances students' overall communication skills.

This study aims to investigate the role of Virtual Reality (VR) technology in improving students' speaking skills and to assess its effectiveness within the classroom environment. By employing a classroom action research approach, the research seeks to uncover the specific advantages of VR in enhancing students' speaking abilities while also evaluating the technology's impact on student engagement and confidence. The cyclical model used in this research facilitates ongoing improvement and adaptation of teaching strategies based on the needs and performance of students (McNiff, 2013). The incorporation of VR in language learning offers insights into personalized learning experiences, allowing each student to learn at their own pace. VR can cater to individual needs by enabling students to practice speaking in diverse contexts and at varying levels of difficulty. This customization can boost motivation and foster a sense of ownership in the learning process, resulting in improved speaking proficiency (Burgin, 2001). As technology continues to advance, integrating VR into language education can better prepare students for the communication demands of an increasingly digital world. The research questions guiding this study are: 1) What role does VR technology play in enhancing students' speaking skills? and 2) How effective is VR in improving student engagement and confidence in speaking? Ultimately, the findings of this study aim to provide valuable insights into the integration of VR technology in language education. By showcasing the positive effects of VR on speaking skills, this research offers educators evidence-based strategies to enhance language instruction and create a more engaging and effective learning environment. The implications of this study extend beyond the immediate classroom context, potentially influencing broader educational practices and policies in language teaching and learning, and equipping students with the essential skills needed to confidently navigate their future careers and global interactions.

2. Research methods

This research was conducted using a qualitative descriptive approach, namely classroom action research using two cycles (John, 2018), (Cresswell, 2018). The process of implementing this classroom action research was designed by the model of Kemmis

& Mc. Taggart whose device consists of four components, namely: Planning (planning), Acting (action), Observing (observation), and Reflecting (reflection). The research flow is explained in the diagram below:

```
┌──────────────┐
│   Planing    │
└──────┬───────┘
       ▼
   ┌──────────────┐
   │   Acting     │
   └──────┬───────┘
          ▼
      ┌──────────────┐
      │  Observing   │
      └──────┬───────┘
             ▼
         ┌──────────────┐
         │  Reflecting  │
         └──────────────┘
```

CAR is carried out by researchers in the classroom that has been made through self-reflection with the aim of improving the quality of the learning process in the classroom, so that student learning outcomes can be improved (Edmonds & Kennedy, 2017), (McNiff, 2013). The main data in this study are quantitative data and qualitative data. The data are taken from: The score of the student's test in performing speaking, including the score of the initial test results and the test results at the end of each action. The results of the observation sheet about the ability to understand the contents of the speaking. The data that will be collected by this researcher are the results of observations and test results (learning outcomes). The test in this study was used to obtain data on student learning outcomes which were carried out after each lesson ended, namely by using an oral test that had been prepared and adapted to VR technology. This analysis technique uses the calculation of the percentage of students' success or achievement in mastering the speaking skill by using a formula:

$$P = \frac{F}{N} \, x \, 100\%$$

Information:

P   : Presentation

F   : Sample frequency (score obtained)

N   : Number of samples

3. Results and Discussion

3.1 Results

The implementation of the actions in the first cycle of the first meeting was held on May 6, 2024, focusing on a practical theme of "Everyday Conversations." The purpose of choosing this theme was to introduce students to common conversational phrases, enabling them to navigate basic dialogues such as greetings, asking for directions, or ordering food in a VR-simulated environment. The session began with greetings and a brief discussion of the lesson objectives to set clear expectations for the VR activities. Before entering the VR session, the researcher collaborated with the class teacher to ensure a smooth flow of activities. A virtual schedule and interactive instructions were shared with students, helping them understand what they would

experience and practice in VR. Once briefed, students were given headsets, and the lesson commenced with a VR simulation where each student participated in a simple, guided conversation scenario. In the VR environment, students were placed in settings such as a virtual café or a tourist information center, where they practiced common phrases and conversational cues. After completing each scenario, students were invited to share their experiences and reflect on areas of difficulty or improvement.

The researcher provided feedback and encouraged students to ask questions, which further enhanced their understanding of conversational flow and phrasing. The second session, held on May 7, 2024, continued with similar VR simulations, this time introducing slightly more advanced conversations. Students practiced dialogues such as requesting assistance or asking for details about items on a menu. The researcher observed each student's performance, noting improvements in fluency and confidence. At the third and fourth meetings, students were encouraged to use their own words to interact with VR characters, simulating conversations with varying contexts such as visiting a marketplace or asking for directions. Instead of following a set script, they improvised based on the context provided in the VR scenario, which helped develop spontaneity and adaptability in communication. Students later discussed these sessions, sharing personal insights on what helped them improve and where they still needed practice.

The activities in the initial VR-based speaking sessions involved students engaging in a series of conversational simulations. Students first familiarized themselves with VR scenarios, such as a virtual café or marketplace, where they were guided through typical phrases and expressions used in everyday interactions. After each VR simulation, students answered questions orally, reflecting on the dialogues they experienced and discussing any challenges they faced. In the third and fourth meetings, the learning activities were consistent with prior sessions, where students revisited similar VR-based scenarios. This activity pushed students to internalize the vocabulary and phrases they practiced, adapting them to create a more authentic and individualized conversational flow. The results of observations on the ability to understand the contents of the speaking materials can be seen in the first cycle table below;

Table 1. Data on Ability to Understand the Contents of Cycle I

No	Name	Aspect 1	Aspect 2	Aspect 3	Aspect 4	Total Score	Score
			CYCLE 1				
1	Student 1	82	78	73	71	304	76.0
2	Student 2	79	84	72	69	304	76.0
3	Student 3	78	77	76	71	302	75.5
4	Student 4	66	62	64	61	253	63.25 _
5	Student 5	42	46	39	41	168	42.0
			TOTAL				331
			mean				66.2

In the second cycle, the average student showed progress in learning outcomes. Compared to the first cycle, the students were able to complete the worksheets with improved accuracy. Based on the assessment of students' learning outcomes using predetermined assessment aspects, the average score obtained by students is 77.1.

These results are derived by calculating the total score of 385.5 divided by the number of students participating in the learning activities, which is 5. The calculation is shown below:

$$X = \frac{\sum X}{N}$$

$$X = \frac{385,5}{5}$$

$$X = 77.1$$

Based on the table above, it can also be seen that four students have achieved a score of 75 or above (≥75), meeting the criteria for completeness, while one student has not yet completed. The classical learning completeness is calculated as follows:

$$\frac{NS}{N} = 100\%$$

$$= \frac{4}{5} \; x \; 100\%$$

$$= 80\%$$

Table 2. Average Score and Learning Completeness Cycle II

Cycle	Average value	Completeness	Category
II	77.1	80%	Well

Based on the data presented in the table, it is evident that four students have achieved a "good" level of comprehension regarding the speaking content delivered through the VR method, while one student is categorized as "sufficient." To gain deeper insights into students' speaking abilities in the second cycle, the researcher calculated the percentage for each aspect of their speaking proficiency. The learning activities designed to enhance speaking skills through immersive VR experiences have yielded positive outcomes, significantly improving students' performance.

Comparative analysis of data from Cycle I and Cycle II reveals an overall improvement in students' speaking proficiency, with most achieving the expected success criteria of a minimum score of 75%. Observations conducted by the researchers indicate that the VR-based learning activities effectively fostered the development of speaking skills, as evidenced by the rising scores across both cycles. This enhancement is particularly noticeable in students' abilities to engage in oral responses, summarize spoken content, and articulate their thoughts in their own words during the VR activities.

The observed progress emphasizes the effectiveness of incorporating VR technology, which provides a dynamic and immersive environment conducive to active participation. The modifications implemented in Cycle II further facilitated a supportive atmosphere for students, promoting greater engagement and confidence in their speaking abilities. Overall, the findings of this research underscore the potential of VR as a transformative tool in language education, enhancing students' capacity to communicate effectively in real-world contexts.

Table 3. Data Recapitulation of Ability to Understand the Content of Speaking Cycle I and Cycle II

Cycle	Average value	Completeness	Category
I	66.2	60%	Enough
II	77. 1	80%	Well

The analysis of the recapitulated data regarding students' speaking proficiency through the VR method, as presented in the table above, reveals a notable comparison between the two cycles. In Cycle I, the average score for speaking skills was recorded at 66.2. This figure showed significant improvement in Cycle II, where the average score rose to 77.1. Additionally, the percentage of students achieving mastery in speaking skills increased from 60% in Cycle I to 80% in Cycle II.

3.2 Discussion

In the initial cycle of this study, which focused on enhancing speaking skills through Virtual Reality (VR) technology, the researchers found limited progress in the students' ability to engage in speaking activities. The classroom action research aimed to improve comprehension of speaking content using VR-enhanced tasks. Although there was some improvement in the first cycle, the outcomes did not meet the mastery criteria set by the researchers, necessitating the continuation into a second cycle. During the first cycle, several challenges were identified that hindered student participation and understanding. The primary issue was the traditional teaching methods employed, which did not effectively showcase the students' speaking abilities. Additionally, the VR resources used were not sufficiently engaging, making it difficult for the students to fully immerse themselves in the speaking tasks. To address these challenges, modifications were planned for the second cycle to ensure that students could reach the desired mastery levels.

The adjustments included allowing students to interact more with the VR environment under the guidance of instructors, ensuring that tasks were sequenced in a clear and comprehensible manner. The use of engaging visual content and interactive activities within the VR framework aimed to boost students' enthusiasm and motivation. Individual support was also prioritized for students struggling with the speaking tasks, alongside better time management during learning sessions. Following these enhancements in the second cycle, significant progress was observed in all aspects of students' speaking abilities. In the first cycle, only 2 out of 5 students achieved the target speaking score, with an average score of 66.15 and a completion rate of 60%. This indicated that the students' speaking skills were below the expected standard, which was a minimum score of 75% for success and a class-wide completion rate of 80%. Consequently, the second cycle was essential for improving these outcomes.

In the second cycle, students' average scores increased to 77.3, reflecting an improvement of 11.15 points compared to the first cycle. This study demonstrated that implementing the VR technology, along with a structured approach, significantly enhanced the students' speaking skills, aligning with their learning needs. The results indicated a steady increase in the percentage of students achieving mastery in speaking tasks from Cycle I to Cycle II, reinforcing the effectiveness of VR as a teaching tool for improving comprehension and engagement.

Overall, the adjustments made in Cycle II yielded positive results, as students became more focused, motivated, and capable of articulating their understanding of the content. The use of VR technology not only facilitated better comprehension but also provided a more interactive and engaging learning experience for the students. This aligns with existing literature that emphasizes the importance of visual and interactive learning methods for enhancing understanding among students with diverse learning needs.

4. Conclusion

This study successfully demonstrated the potential of Virtual Reality (VR) technology in enhancing students' speaking skills. By immersing learners in realistic virtual environments, VR provided an effective platform for practicing language in context. Through the implementation of a classroom action research approach, the study iteratively refined the VR-based learning experiences, leading to significant improvements in student engagement and performance. The findings revealed that VR can significantly enhance students' speaking abilities by providing opportunities for real-world practice, increasing motivation, and fostering a supportive learning environment. The observed improvements in students' speaking skills, particularly in terms of fluency, accuracy, and confidence, highlight the effectiveness of VR as a valuable tool for language education. Furthermore, the study underscores the importance of careful planning and implementation of VR-based learning experiences. The iterative nature of the classroom action research approach allowed for continuous refinement of the teaching strategies and assessment methods, ensuring optimal learning outcomes.

References

Arini, R. E. (2023). Merangkul teknologi: Mengintegrasikan realitas virtual dalam pengalaman pembelajaran. Jurnal Pendidikan West Science, 1(6), 350–356.

Bainbridge, W. S. (2007). The scientific research potential of virtual worlds. Science, 317(5837), 472–476. https://doi.org/10.1126/science.1146930

Bombari, D., Schmid Mast, M., Canadas, E., & Bachmann, M. (2015). Studying social interactions through immersive virtual environment technology: Virtues, pitfalls, and future challenges. Frontiers in Psychology, 6, 869. https://doi.org/10.3389/fpsyg.2015.00869

Bonner, E., & Reinders, H. (2018). Augmented and virtual reality in the language classroom: Practical ideas. Teaching English with Technology, 18(3), 33–53.

Burgin, B. (2001). Qualitative education methodology. Jakarta: Raja Grafindo Persada.

Byram, M. (2009). From foreign language learning to intercultural communicative competence: Studies in education and second language learning. Multilingual Matters.

Cafferty, S. G., Jacobs, G. M., & Dasilva Iddings, A. C. (2006). Cooperative learning and second language teaching. New York: Cambridge University Press.

Chang, H., Park, J., & Suh, J. (2023). Virtual reality as a pedagogical tool: An experimental study of English learners in lower elementary grades. Education and Information Technologies, 1–34.

Chien, S. Y., Hwang, G. J., & Jong, M. S. Y. (2020). Effects of peer assessment within the context of spherical video-based virtual reality on EFL students' English-Speaking performance and learning perceptions. *Computers & Education*, *146*, 103751.

Creswell, J. W., & Creswell, J. D. (2018). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). LA: SAGE.

Daniels, M. M. (2021). Usability assessment of virtual reality as a training tool for oral presentation. IOP Conference Series: Materials Science and Engineering, 1077(1), 012047. https://doi.org/10.1088/1757-899X/1077/1/012047

Edmonds, W. A., & Kennedy, T. D. (2017). An applied guide to research designs: Quantitative, qualitative, and mixed methods (2nd ed.). London: Sage.

Ikhsaniyah, N. (2022). An analysis of students' speaking anxiety: Possible causes and coping strategies.

Indrianty, S. (2018). Students' anxiety in speaking English (A case study in one hotel and tourism college in Bandung). Eltin, 4(1), 28–39.

John, W. C., & J, D. C. (2018). Research design (Qualitative, quantitative, and mixed methods approaches) (5th ed.)

Karim, K., Yusnan, M., Farisatma, F., Krisnawati, K., & Kamasiah, K. (2023). Improving Text Reading Comprehension Using Picture Story Media in Indonesian Language Learning for Elementary School Students. *AIQU: Journal Multidiscipliner of Science*, *1*(1), 19-28.

Khamkhien, A. (2010). Teaching English speaking and English speaking tests in the Thai context: A reflection from Thai perspectives. English Language Journal, 184–200.

Kuna, P., Haskova, A., & Borza, L. (2023). Creation of virtual reality for education purposes. Sustainability, 15(9), 7153. https://doi.org/10.3390/su15097153

Mahajan, R. (2015). The key role of communication skills in the life of professionals. Journal of Humanities and Social Sciences, 20(12), 36–39. https://doi.org/10.9790/0837-201223639

McGovern, E., Moreira, G., & Luna-Nevarez, C. (2020). An application of virtual reality in education: Can this technology enhance the quality of students' learning experience?. *Journal of education for business*, *95*(7), 490-496.

McNiff, J. (2013). Action research: Principles and practice (3rd ed.). Abingdon: Routledge. https://doi.org/10.4324/9780203112755

Nation, I. S. P., & Newton, J. (2009). Teaching ESL/EFL listening and speaking. New York: Routledge.

Nunan, D. (1989). Designing tasks for the communicative classroom. Cambridge: Cambridge University Press.

Pfeifer, M., & Head, B. A. (2018). Which critical communication skills are essential for interdisciplinary end-of-life discussions? AMA Journal of Ethics, 20(8), E724–E731. https://doi.org/10.1001/amajethics.2018.724

Raman, K., Hashim, H., & Ismail, H. H. (2021). Exploring the Impact of VR Integration on ESL Leaners' English Verbal Communication Skills: A Case Study in a Malaysian High School. *Arab World English Journal*.

Rao, S. P. (2018). Developing speaking skills in ESL or EFL settings. International Journal of English Language, Literature and Translation Studies, 5(2), 286–293. https://doi.org/10.33329/ijelr.52.286

Richards, J. C., & Rodgers, T. S. (2001). Approaches and methods in language teaching. Cambridge University Press.

Soto, Juan Bendeck, Diana Toro Ocampo, Lued Beltrán Colon, and Alejandro Valencia Oropesa. "Perceptions of ImmerseMe virtual reality platform to improve English communicative skills in higher education." (2020): 4-19.

Sulisworo, D., Erviana, V. Y., & Robi'in, B. (2018). Virtual reality in education: Designing immersive and innovative learning experiences. Yogyakarta: K. Media.

Thornbury, S. (2005). How to teach speaking. Pearson Longman.

Zakirova, D. Y., Haydarov, I. T., Hamrayeva, S. S., Shadmanbekova, K. A., & Tulaganova, D. A. (2020). The use of ICT in foreign language learning and teaching. Journal of Critical Reviews, 7(5). https://doi.org/10.31838/jcr.07.05.156